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SOME NOTES ON THE LARVAE AND JUVENILES OF HALF-BEAK, *HEMIRHAMPHUS XANTHOPTERUS* (VAL) IN IRAQI WATERS

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Biologists, while investigating the lifehistory, distribution, spawning and systematics of a species,recognize the need of identifying the larvae and juveniles of fishes.During the survey of fish fauna of Shatt-Al-Arab from September 1973 to August 1974,the authors collected a number of larval and juvenile fishes by hand nets.In these collections the following fishes were found : juveniles of *Mugil hishni* Misra,cyprinoid larvae,*Garra rufus* Heckel, *Aphanius dispar* Ruppel and *Hemirhamphus xanthopterus* (Valenciennes).

The halfbeaks abound in warm water and breed in quiet water.The eggs are demersal and adhesive,and become entangled with their filaments to the plants until the larvae emerge.There is no information on the biology of Hemirhamphidae from Shatt-Al-Arab and Arabian Gulf though considerable attention has been paid to the larval studies from Indian waters i. e., the larval and postlarval stages of *H. limbatus* Cuv.Val.(Bhattacharya 1910) from Chilka lake, *H. gaimardi* Cuv. Val.(Job and Jones 1938; Nair 1952), *H. georgii* Cuv. Val.(Devanesan 1937, Chidambaram

and Menon 1948, Kuthalingam 1959), *H. far* (Forsk.) (Vijayaraghavan 1957) from Madras coast, *Zenarchopterus buffoni* Cuv. Val. (Jones and Pantulu 1958) from Orissa coast, *Hyprhamphus quoyi* Cuv. Val. (Sudarsan 1967) from Mandapam area and *H. marginatus* (Forsk.) (Talwar 1962,67) from Gulf of Manar and Palk Bay.

MATERIALS AND METHODS

Fifty–one specimens of *H. xanthopterus*, 5·8- 69 mm in total length, were collected from near Chibashi Creek (Shatt–Al–Arab) on May 15, August 8 and 30, 1974 at low tides with $\frac{1}{2}$ and $\frac{1}{4}$ long hand nets from the boat; the Chibashi Creek lies nearly 110 km upstream from Arabian Gulf at Fao. Both fresh and preserved (10 % neutral formalin) specimens were studied. Ocular micrometers were used for measuring small larvae and their parts.

OBSERVATIONS

The larvae were found leaping along the waves away or near the shore generally among *Pharagmatus communis* Trim. The specimens larger than 40 mm in total length were difficult to net because of their swift leaping along the water.

The following stages were represented; their measurements are given in table 1.

Larva: 5.8–7.5 mm in total length (Fig. 1,A)

Long, slender and transparent. The yolk absorbed, dorsal, caudal and anal fins continuous but the demareations for dorsal and anal fins distinguishable. The pectoral fins transparent, short and round; pelvic fins absent; caudal nearly truncate with 12–14 rudimentary rays. Myomeres 61; anus opened at 40th myomere and had 21 post–anal myomeres.

Mouth superior, the lower jaw lifted up and pigmented with rounded melanophores. On the upper jaw the pigments grouped into specific spots

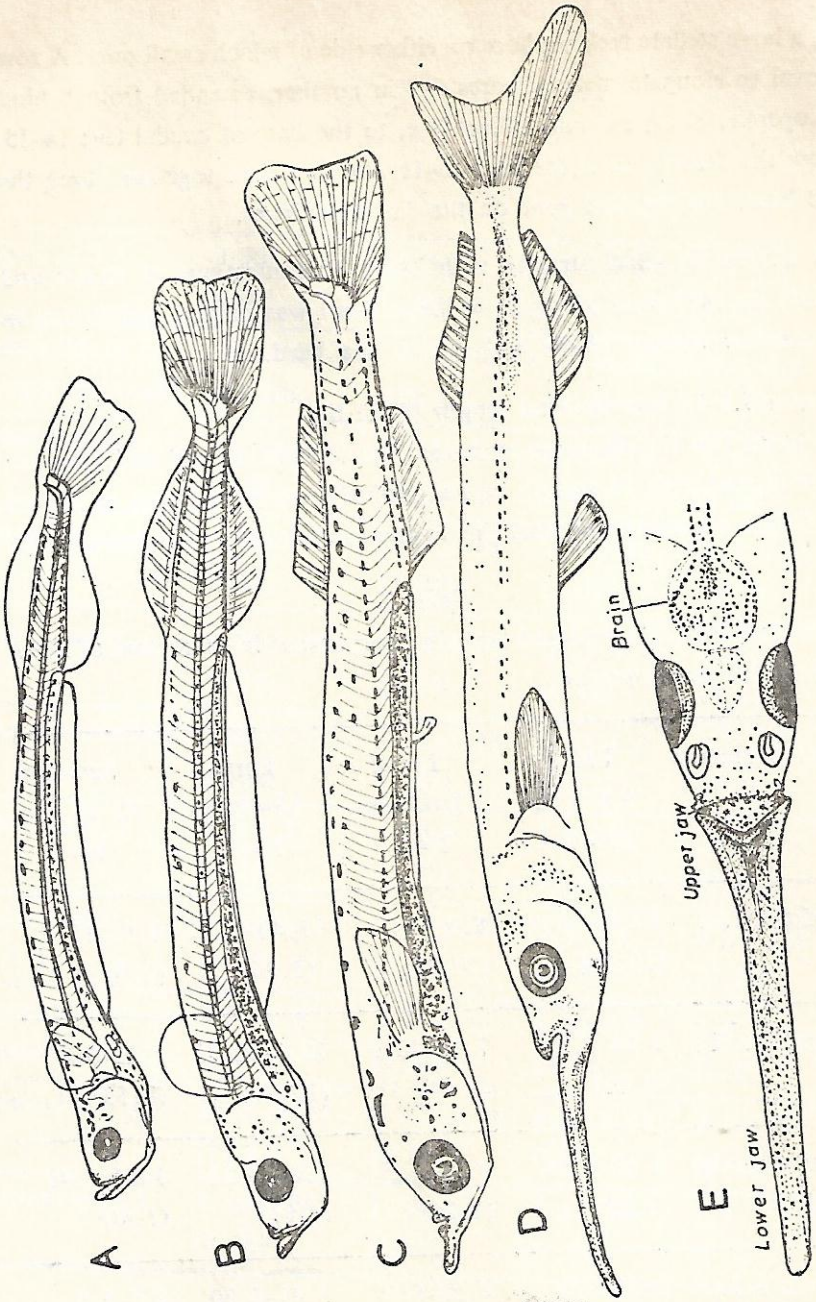

Fig 1: Larvae and juvenile of *Hemirhamphus xanthopterus*, A. Larva 5.8; B: Larva: 8,0; C. Larva 14.8; D: Juvenile 45 (total length measurement in mm); D: dorsal view of the head of D:

i.e., a large stellate melanophore on either side of which small ones. A row of oval to elongate melanophores 6–7 in number, extended from behind the opercle, along the mid-lateral line, to the base of caudal fin; 14–15 below the future dorsal fin and 15–16 almost linked together along the anal base. No pigment spot on the fin membranes.

The alimentary canal straight with heavy concentrations of round and stellate melanophores along its wall.The heart was marked palpitating in the cardiac coelom below and behind the head.

Larva : 7.5–12 mm in total length (Fig.1,B)
The lower jaw slightly more elongated than before. Dorsal and anal fins differentiated with 14 and 15 rays repectively and caudal rays numbered 16. Origin of dorsal and anal fins at the same level. Pelvic fins absent.

Table 1.

Measurements of larval and juvenile morphometric characters of *Hemirhamphus xanthopterus*

Measurements	Larva 5.8–7 mm N=5	Larva 8–12 mm N=5	Larva 13–18 mm N=5	Juvenile 45–69 mm N=2
Height in T.L.	10.44–10.91 (10.68)	8.0–12.22 (10.92)	11.40–13.0 (12.26)	8.62–11.3 (9.9)
Height in S.L.	7.94–9.37 (8.66)	7.84–10.9 (9.54)	10.6–10.87 (10.74)	7.25–9.8 (8.52)
Width of body in height	3.50–2.56 (3.03)	0.94–1.5 (1.36)	1.08–3.33 (1.85)	1.35–1.45 (1.40)
Head in T.L.	5.13–5.0 (5.07)	4.50–6.0 (5.15)	5.41–6.30 (5.73)	4.5–5.3 (4.9)

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Head in S.L	3.90–4.28 (4.09)	3.9–5.26 (4.60)	4.52–5.60 (5.40)	3.9–5.2 (4.55)
Mandible in T.L. (upper jaw-beak)	73.12–58.33 (65.28)	30.67–70.83 (50.13)	11.40–32.50 (31.94)	4.1–4.6 (4.35)
Mandible in H.L.	11.66–14.0 (12.88)	7.50–16.67 (11.97)	2.08–6.0 (3.84)	0.9–0.86 (0.88)
Eye in H.L.	1.94–2.19 (2.06)	2.31–3.88 (2.99)	2.6–2.81 (2.69)	3.3–3.25 (3.27)
Eye in snout	0.38–0.39 (0.36)	0.31–0.86 (0.63)	0.39–0.56 (0.48)	1.0–1.0 (1.0)
Eye in postorbital	1.08–1.55 (1.31)	1.31–1.53 (1.43)	1.25–1.3 (1.27)	1.3–1.5 (1.4)
Snout in H.L.	5.0–5.7 (5.35)	3.08–8.6 (5.21)	5.0–6.85 (5.68)	3.3–3.25 (3.27)
Interorbital in H.L.	7.0–7.6 (7.35)	1.93–4.27 (3.12)	2.6–3.9 (3.2)	3.3–3.25 (3.27)
Interorbital in postorbital	3.73–3.8 (3.76)	0.78–1.82 (1.35)	1.25–8.0 (4.62)	1.3–1.5 (1.4)
Pectoral in S.L.	10.0–19.34 (14.67)	6.72–11.08 (8.19)	6.67–8.33 (7.7)	6.5–5.8 (6.15)
Pectoral in H.L.	2.33–4.96 (3.64)	1.3–2.14 (1.77)	1.3–1.84 (1.54)	1.7–1.3 (1.5)

Note : T.L. total length from tip of upper jaw to caudal fin,S.L.standard length from tip of upper jaw to the base of caudal fin,H.L.head length from tip of upper jaw to the branchial opening N.the number of specimens Numbers in parenthesis are the average numbers.

The arrangement of pigments and number of myomeres same as before; 32 melanophores marked along the mid–lateral line, larger ones, nearly 0.12 X 0.04 mm along the posterior part of the body.

Gill openings wide, gill membranes not united with isthmus.Alizarine Red preparations revealed the magnitude of ossification, in lower jaw greater than in upper jaw;hypurals incompletely ossified. Branchiostegals 10, the last two unossified at this stage. Vertebrae 47.

Larva: 13–18 mm in total length (Fig.1, C)

The lower jaw more prominently elongated than upper jaw, 0.3 mm long appeared in 14.8 mm larva and lies nearly equidistant between the base of caudal fin and eye;pelvic rays not distinguishable. The lower lobe of caudal slightly increased.

Juvenile: 45–69 mm in total length (Fig.1, D)

A row of more than 64 melanophores along each side of the mid–dorsal line from behind the head to the origin of dorsal fin,myomeres indistinct. The lower jaw considerably elongated with its tip coral red,no teeth on the beak. The caudal distinctly forked, the lower lobe considerably increased. Gill arch 6.14 mm long in a 45 mm long juvenile with 25 long filamentous gill –rakers.

The triangular upper jaw formed by the intermaxillaries rather bluntly pointed at the apex and broader at the base than its length.The margin of the mandible diverging little until the posterior end was reached.The nasal width 3.0 in eye,and nasal barbel nearly 0.3 mm long in a 45 mm specimen. The cycloid scales were first marked in a 22 mm specimen in the antero-dorsal position behind head.By 45 mm the scales covered the whole body but not marked on the upper jaw;the lateral scales numbered 50–53, an accurate counting was difficult because scales were missing from the sides. They measured 2.O× 1.5 mm. The dorsal and anal fins low, heighest anteriorly with ray 2–3 longest,

In fresh condition the tip of the beak was coral–red, the chin and throat silvery, and a silvery band ran along each side of the body. In preserved

specimens the upper surface of the body slightly darker, the upper surface of the head in life was blue and green varying in brilliance. On each side of the body was a dark band,silvery in life,which was narrow anteriorly but became broadest between dorsal and anal fins. The lower surface of the mandible was finely pigmented with black chromatophores fading posteriorly so that both chin and throat was largely colourless.The dorsal and caudal fins marked with black punctuations, the other fins were mostly pale.

DISCUSSION AND CONCLUSION

The morphological characters mainly the lower jaw being produced into a beak signify that the larvae and juveniles belong to the Hemirhamphidae and not to the Belonidae.

Of the three species of halfbeaks i.e. *H. marginatus* (Forsk.),*H.gaimardi* and *H.georgii* recorded from Arabian Gulf (Mahdi & George 1969, Kuronuma and Abe 1971), only *H. georgii* was reported from Shatt-Al-Arab(Mahdi 1962). Our specimens(i.e. juveniles)possess the triangualr upper jaw broader than long, the dorsal and anal fins equal and originate at the same level,pectoral shorter than head and thus differ from *H.georgii* in which the upper jaw is longer than broad, the anal fins originate 3–4 rays behind dorsal and are unequal, and pectorals not as long as head.

Our specimens, both larvae and juveniles have 16 haemal vertebrae like *H. marginatus* while *H. contori* (Blk.) ,*H. quoyi* and *H. dussumieri* (Cuv. Val.)possess more than 17(Talwar 1967)..The ventrals arose much nearer the caudal than to the pectoral in *H. far,H. georgii,H. contori* and *H.marginatus,*while in *H.xanthopterus* and *H. gaimardi* the ventrals arose about half–way between the base of the caudal and the eye(Day 1889)(Table 2).

Table 2.

Position of pelvic fin in relation to caudal base,eye and pectoral fins of *Hemirhamphus* sp.based on descriptions and figures after Gunther(1889), Weber and De Beaufort (1922) and Mahdi (1971)

	H. marginatus	H. gaimardi	H. far	H. contori	H. georgii	H. xanthopterus	Our specimen
Pelvic-Caudal / Pelvic-gill	0.78	1.22	0.67	0.63	0.77	1.09	1.29
Pelvic-caudal / Pelvic–eye	0.64	1.04	0.57	0.54	0.66	0.84	1.04
Pelvic-caudal / Pelvic-pectoral	0.74	1.24	0.71	0.65	0.80	1.14	1.05

The red tipped beak of *H. xanthopterus* could make it easily distinguishable from *H. gaimardi* in which it is only pigmented without any colouration. Moreover, the head is 6 in standard length (Mahdi 1971) and the caudal emarginate (Weber & De Beaufort 1922) *in H. gaimardi*, while in our specimens of *H. xanthopterus* the head is 3.9–5.2 (table 1) and the caudal is forked, the lower lobe prominently longer.

From the foregoing discussion it is clear that the larvae and juveniles belong to *H. xanthopterus*. This species has not been reported before from Iraqi waters and hence forms a new record.

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SUMMARY

The larvae and juveniles of *Hemirhamphus xanthopterus* (Val.) measuring 5.8–69 mm, collected from Shatt-Al-Arab near Chibashi Creek between May 15 and August 30, 1974 are described and figured. This species has not been recorded earlier from Iraqi waters and hence forms a new record.

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الملخص

جمعت صغار سمك القنبرور بحجم ٥,٨ – ٦٩ ملم. من شط العرب في منطقة نهر الكباسي في الفترة الواقعة بين مايس وآب من سنة ١٩٧٤ . وقد اعطيت الأوصاف والصور كاملة يتم تسجيل هذا النوع لأول مرة في هذه المنطقة .